

The background of the slide is a large, stylized American flag. The stars are white on a dark blue field, and the stripes are red and white. In the center, there is a dark silhouette of an Abrams tank, facing right. The tank's main gun barrel is extended to the right. The title "Abrams Tank System" is written in a large, white, italicized serif font, centered over the tank and the flag.

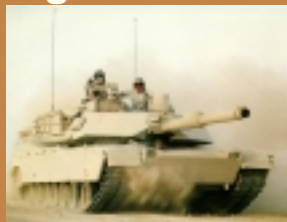
Abrams Tank System

**Presented To
The PEO SYSCOM
Conference**

**Colonel James R. Moran
Project Manager
Abrams Tank System**

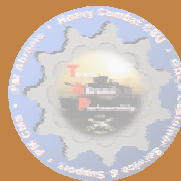


Program



Overview

Abrams Teaming



Programs

Total Ownership

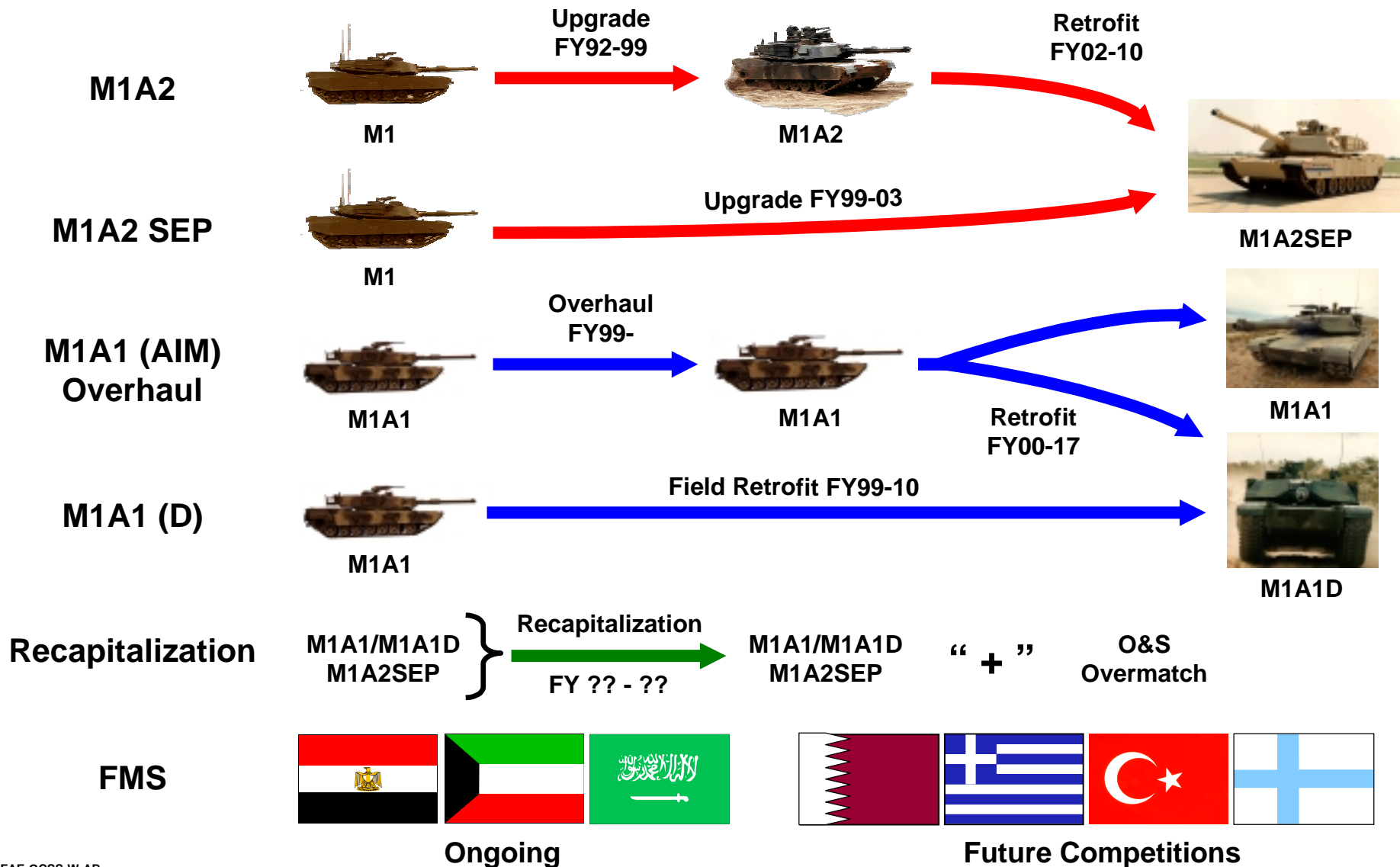


Cost Reduction



Abrams Tank System

Programs Within the Project





Comparison



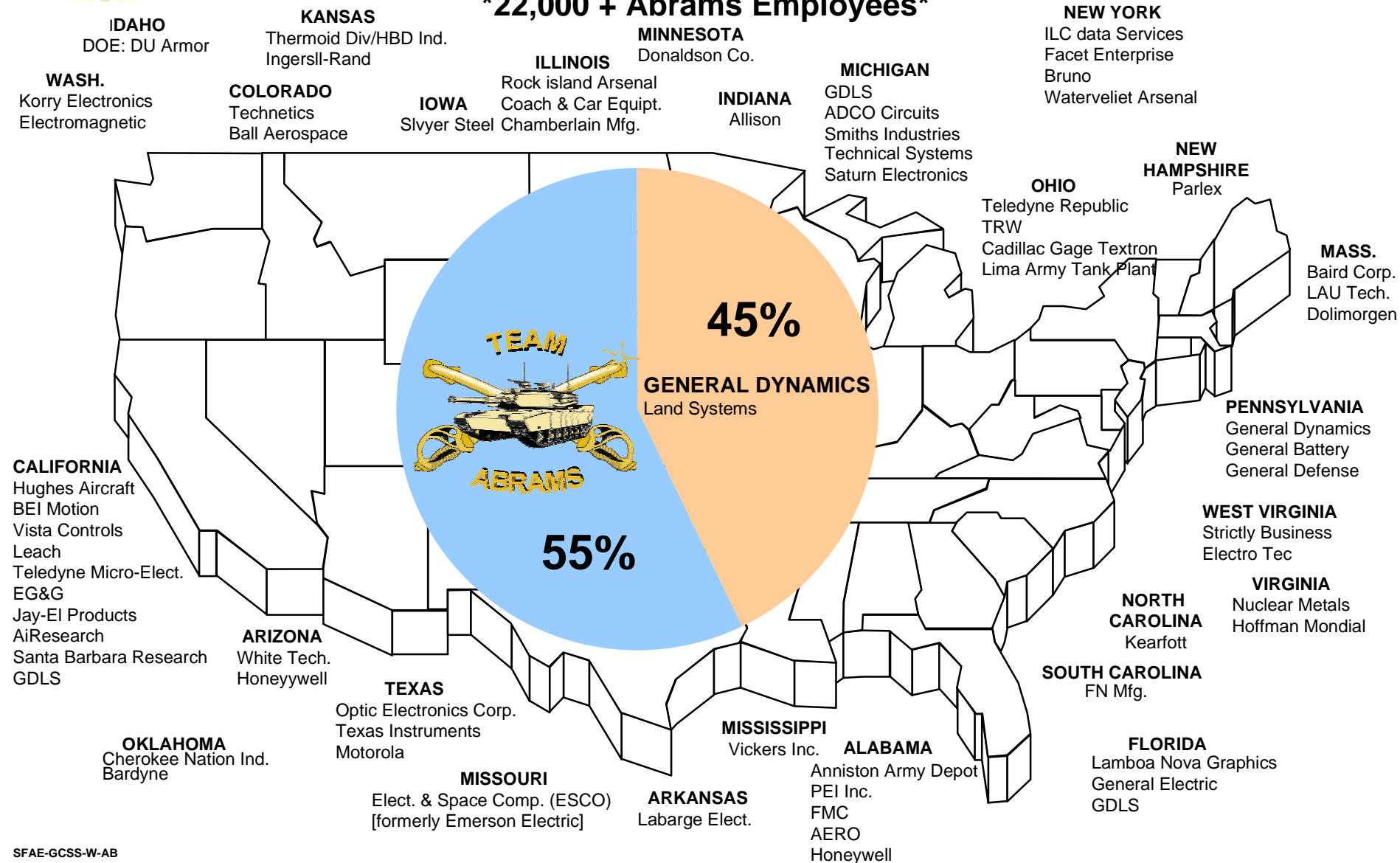
CAPABILITY	M1/IP	M1A1	M1A1D	M1A2	M1A2 SEP
2nd Gen FLIR					✓
DU Armor		10th yr +	✓	✓	✓
Two FLIRs (GPS & CITV)				✓	✓
ACOE			✓ Applique Only		✓
Far Target Designation			✓	✓	✓
On-board BIT/FIT System Diagnostics				✓	✓
Driver's Steer to				✓	✓
Eyesafe Laser Range Finder			✓	✓	✓
Location/Navigation		GPS	Integr GPS/NAV	POS/NAV	GPS+POS/NAV
Auxiliary Power Unit			Some	Temporary	UAAPU
Thermal Management (AC)					✓
Hull/Turret Orientation				✓	✓
Color Displays			✓ Applique Only		✓
Room for Growth	None	Limited	Limited	Limited	✓
Signature Management					✓



Tank Industrial Base



300 Contracts
1,000 Companies (with 2nd/3rd Tier)
22,000 + Abrams Employees





Aging Tank Fleet



Abrams Tanks Produced → 9,189 (w/FMS)

RDT&E Investment → \$25B

1985

1990

2000

2010

2020

2030

M1/IPs

(% of Fleet/Average Age)



(100%, 2yrs)
3046



(47%, 6.8yrs)
3268



(32%, 16.8yrs)
2506



(20%, 26.8yrs)
1454



(18%, 36.8yrs)
1259



(18%, 46.8yrs)
1259

M1A1 (Analog System)

(% of Fleet/Average Age)



(53%, 2.5yrs)
3702



(59%, 10.9yrs)
4550



(63%, 20.9yrs)
4550



(65%, 30.9yrs)
4550



(65%, 40.9yrs)
4550

M1A2/SEP (Digital System)

(% of Fleet/Average Age)



(9%, 2.9yrs)
714



(16%, 11.8yrs)
1174



(17%, 21.8yrs)
1174



(17%, 31.8yrs)
1174



Program



Overview

Abrams Teaming



Programs

Total Ownership



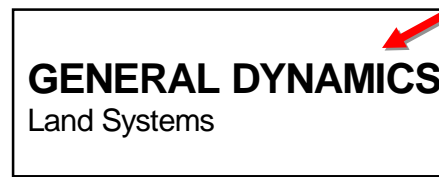
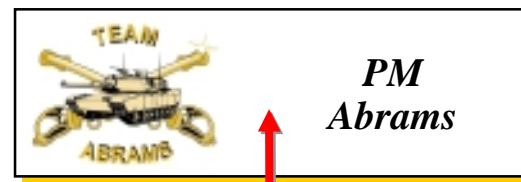
Cost Reduction



Teaming Programs

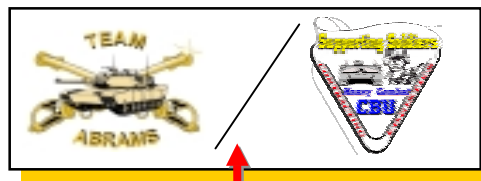


M1A2 SEP Production



M1A1 AIM Overhaul Program

Contract Award: 28 September 1998



PROSE

Contract Award: 7 May 1999



Team Abrams Partnership

Contract Award: 24 September 1999



M1A2 SEP Upgrade Process



M1

M1A2 SEP

ANNISTON ARMY DEPOT

Receive M1



Disassemble



Common Hull / Turret
Components to Rebuild



Clean
Inspect
Teardown
Rework

Inspect for
Serviceability

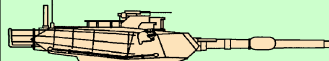
Triage

GFE Refurbished /
Repaired Components

Rebuild
Major

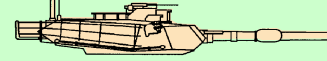
LIMA ARMY TANK PLANT

Build New Turret

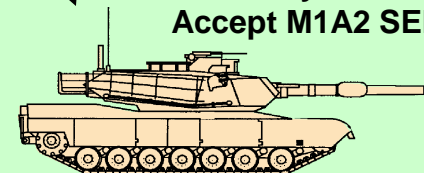


Refurbished Turret
GFE Components
(Fire Control Components /
Hughes, Kollmorgen)

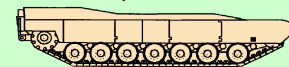
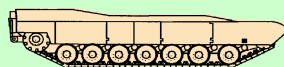
Assemble



Marry and
Accept M1A2 SEP



Modify Hull

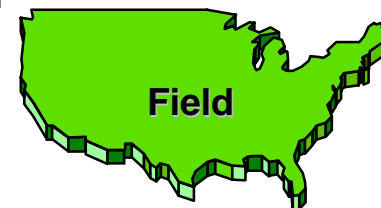


Bonded Stores

Clean Items
for Issue

Dispose of
Unserviceable /
Unneeded Items

Assemble IAW
Upgrade TDP



Issue to
Force

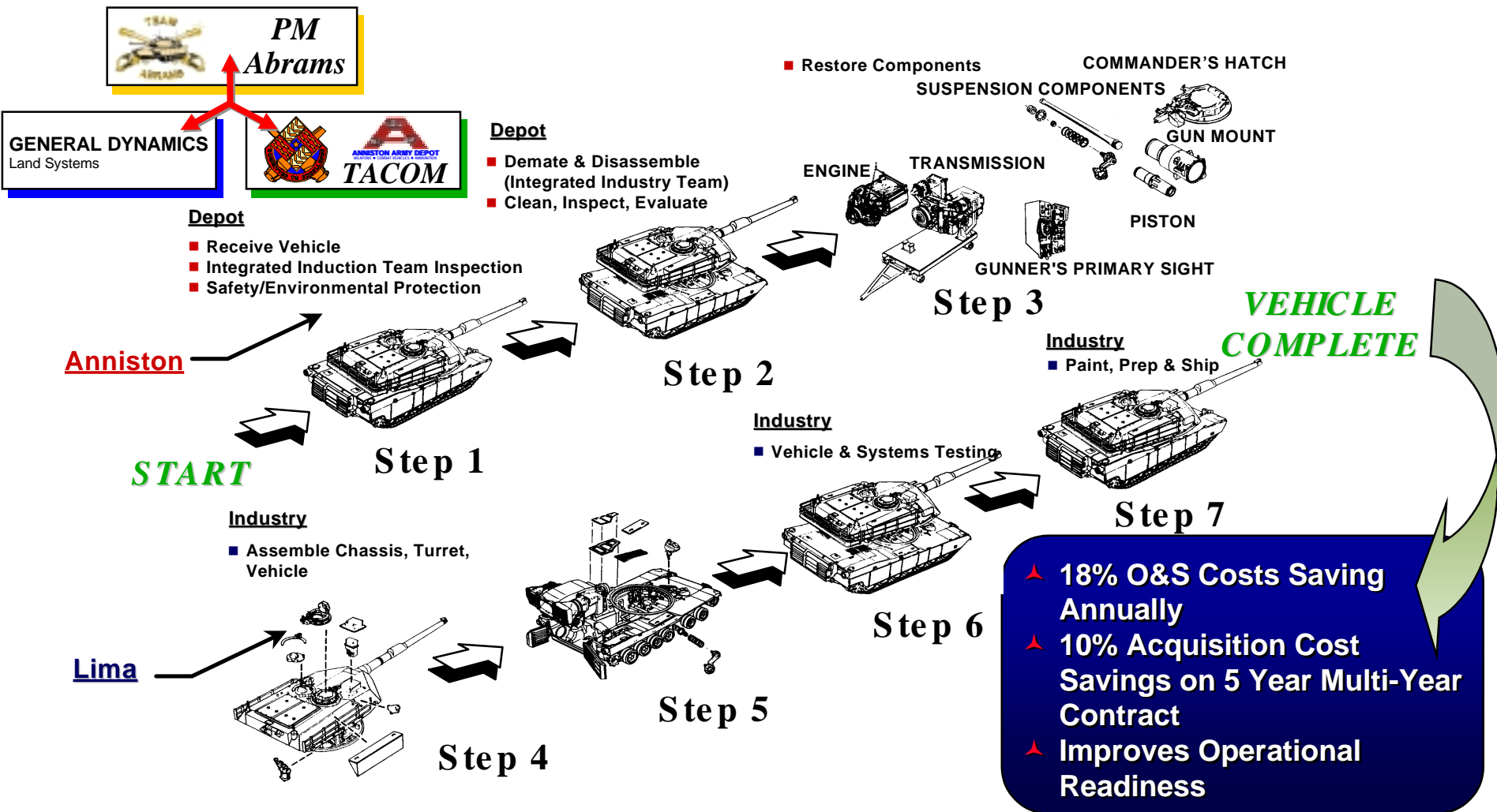
Transmission Rebuild / Allison
Engine Rebuild / ANAD



AIM Overhaul Program



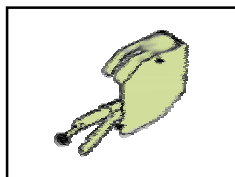
Description: The innovative teaming of depot (ANAD) and contractor (GDLS), AIM Overhaul rebuilds tanks to original factory standards, applies all current MWOs and delivers a tank in “like new” condition but still operates with 1980’s technology. It also provides a cost effective opportunity to apply high-payoff recapitalization projects at a greatly reduced cost when compared to field retrofit.



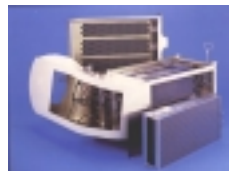


AIM Overhaul Program

Applied Improvements



**Battlefield Override
(Mechanical Fuel &
Transmission Bypass)**



**Pulse Jet Air
System (PJS)**

**External Auxiliary
Power Unit (EAPU)**



Installation Kit

M1A1D "A" Kit



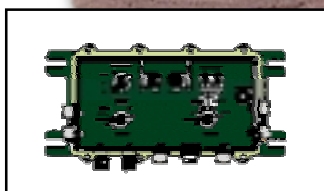
**Upgraded Tank
Commander's Panel**



**Eye Safe Laser
Rangefinder**



**Revised Turret
Networks Box**



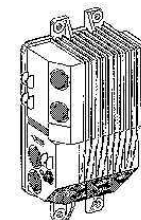
**Vehicle Intercom System
(Replace Analog System)**



**Drivers Hatch Interlock
(DHI)**



**Digital Electronics
Control Unit**



**Revised Hull
Networks Box**





Abrams Engine (Phase I PROSE)

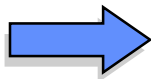


Partnership



- ▲ Program/Project Management
- ▲ Customer Support
- ▲ Supply Chain Management
- ▲ Inventory/Kitting
- ▲ Project Engineering
- ▲ Field Service Engineering
- ▲ Quality Assurance

- ▲ Repair and Overhaul
- ▲ Quality Assurance
- ▲ Testing
- ▲ Field Service
- ▲ Failure Analysis Support
- ▲ Sustainment Mgmt



Process

Old

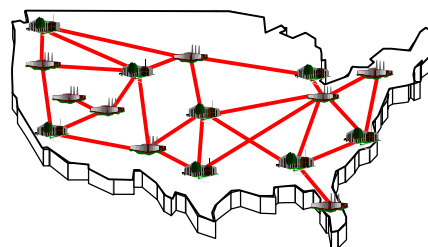
- ▲ Too Many Players
- ▲ Process Improvements not Timely
- ▲ Lack of Management Focus

New

- ▲ Partnership With Government and Industry
- ▲ Incorporate Best Commercial Practices
- ▲ Performance Spec
- ▲ Continuous Improvements

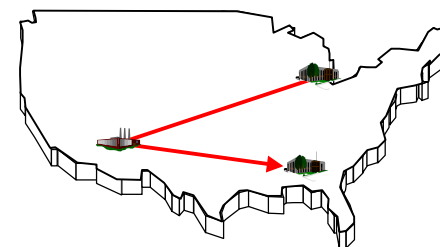
Parts

Old



- ▲ Multiple Buyers
- ▲ Multiple Commands
- ▲ Multiple Contractors

New



- ▲ One Buyer
- ▲ One Command
- ▲ One Source of Supply



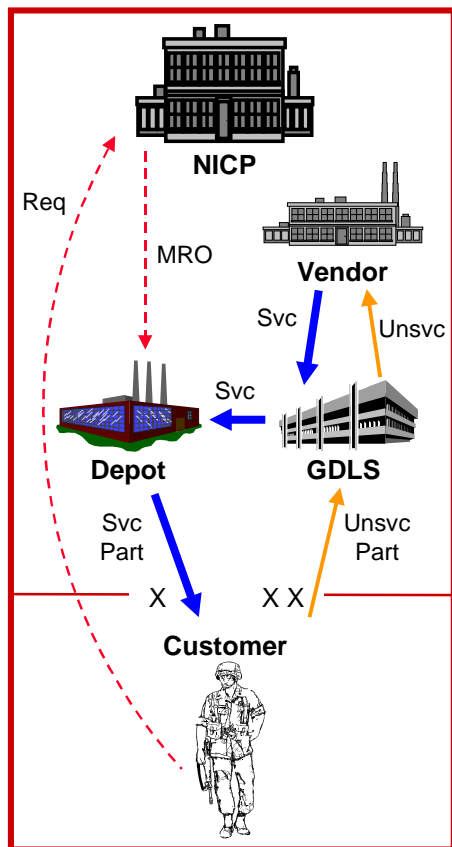
Team Abrams Partnership (TAP)

PM/AMC/OEM



Logistics Evolution

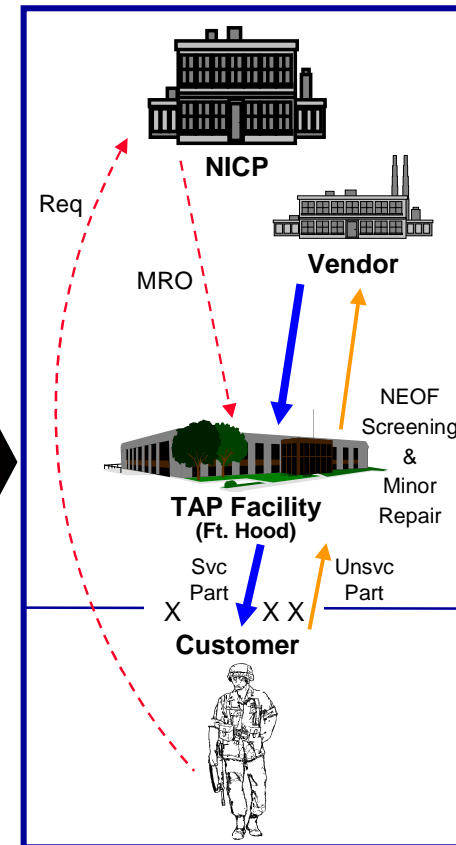
Old Process



Improvements/Benefits

- ▲ **Reduced Cycle Times**
 - ✦ Increased Readiness
 - ✦ Reduced Pipeline/Costs
- ▲ **15% Surcharge Reduction**
 - ✦ No Up-Front Customer Funding Required
- ▲ **Standard Retail Supply System**
 - ✦ Invisible to Soldier
- ▲ **Direct Vendor Delivery**

New Process



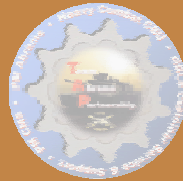


Program



Overview

Abrams Teaming



Programs

Total Ownership



Cost Reduction



Guidance

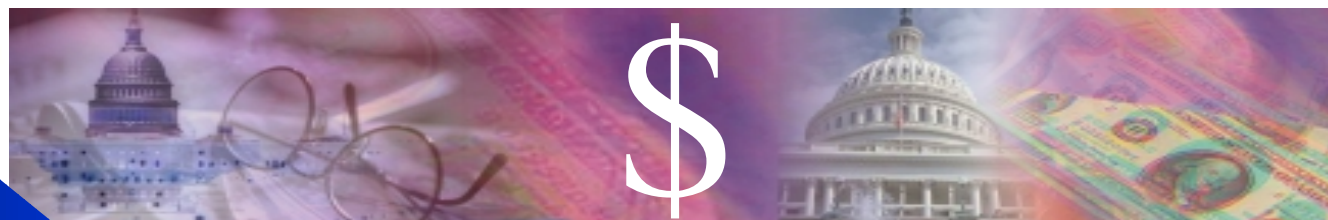


- ▲ ***“I View the Need to Address the Increasing Ownership Costs Involved in Operating the Tank Fleet as Paramount.”***
-Dr. J.S. Gansler
Defense Acquisition Executive
- ▲ ***Total Ownership Cost Reduction Efforts - “I Would Like (to see) Your Proposed Plan to Achieving These Goals.”***
- Paul J. Hoeper
Army Acquisition Executive
- ▲ ***“Reduce Total Life Cycle Costs and Acquisition Time; Identify and Reduce Top 10 Cost Drivers; Reduce O&S Costs of Fielded Systems.”***
-LTG Paul J. Kern
MILDEP to Army Acquisition Executive

PM Must Have Partnership With Logistics Community to Execute



Guidance vs Reality

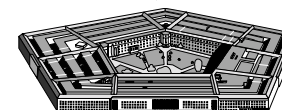
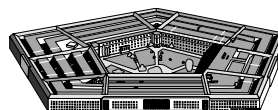
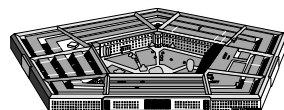


Budget Input
(PM & AMC)

RDT&E

Procurement

OMA



★★★★



Depots



Arsenals



PM



Units



The Challenges

(Between Now & 2030)



★ Readiness:

- ★ Modernization By Fleet Replacement Has Ended
- ★ AIM Overhaul Insufficiently Funded (Currently 59+yr Cycle)
- ★ Little/No Funding for OSCR/MTS After Production
- ★ How Long Can We Sustain 1980's Technology?

★ Combat Effectiveness:

- ★ How Long Will M1A2 SEP Remain "Best In The World"?
- ★ Is M1A1D Adequate For 2/3 of the Active Fleet and Entire NG Fleet? (Recap?)
- ★ What P3I Will be Required to Maintain Combat Overmatch?
 - ★ Vehicle Integrated Defense System (VIDS)/Armor Package Upgrade (APS)
 - ★ Signature Reduction
 - ★ Lethality

★ Industrial Base:

- ★ Loss of 2nd and 3rd Tier Vendors
- ★ How Confident that the Current Facilities are not Required for Future Combat System (FCS)
- ★ Army Benefits From Political Support in Current Industrial Base



Focus on Four Key Initiatives



Tools

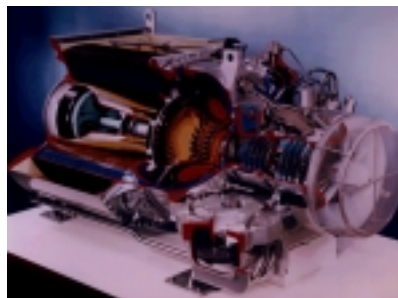


Abrams

Pilot

#1

Abrams Engine System



#2

Abrams Integrated Management Program (AIM)



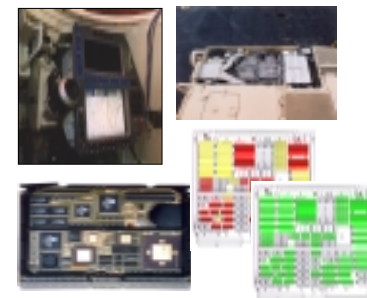
#3

Technical Support



#4

Performance Based Field Logistics Support-M1A2 Unique





Focus on Four Key Initiatives



Tools

**Best
Commercial
Practices**

**Competitively
Source
Product
Support**

**Modernization
Through
Spares**

**PM
Life Cycle
Responsibility
(PMOLCS)**

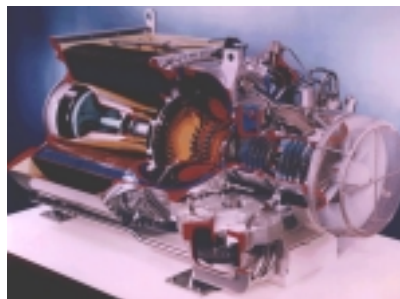
**Increase
Prime Vendor
&
Virtual
Prime Vendor**

Abrams

Pilot

#1

**Abrams Engine
System**



#2

**Abrams Integrated
Management Program
(AIM)**



#3

**Technical
Support**



#4

**Performance
Based Field
Logistics Support-
M1A2 Unique**





Abrams Engine System - Background



- ▲ **The AGT 1500 Turbine Engine Program**
 - ★ Technology From Late '60s
 - ★ 12,163 Produced
 - ★ Last New U.S. Engine in 1992
 - ★ M1A2/AIM Programs Use Overhauled Engines

- ▲ **Reliability and Durability Improvements**
 - ★ Digital Electronic Control Unit (DECU) (1990)
 - ★ Boltless Rotor (1997)
 - ★ Improved Recuperator (1995)
 - ★ Service Life Extension (SLE) Program (1995)



Not Enough...(Currently 335-525 MTBR)

Engine is Biggest O&S Cost Driver (64%); SA Directed PMs To Reduce O&S Costs If Leadership is Serious; We Must Focus on Engine



Abrams Engine System



AGT 1500 Engine
(Current Engine)

Phase I

**Near Term Partnership to
Rebuild AGT 1500 Engine
(PROSE)**

**Mid/Long Term Partnership to
Incorporate New Engine into
Active Fleet**

Phase II



New Engine

Goal: O&S Cost Reduction



Abrams Engine (Phase I PROSE)



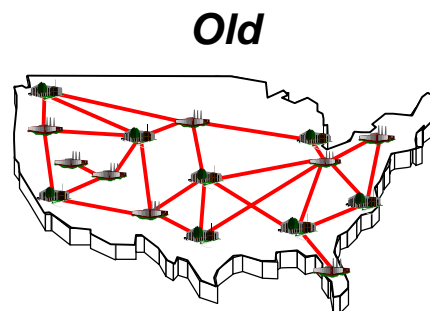
Partnership

Parts

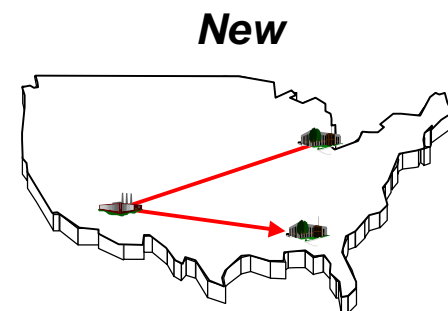


- ▲ Program/Project Management
- ▲ Customer Support
- ▲ Supply Chain Management
- ▲ Inventory/Kitting
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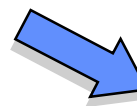
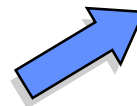
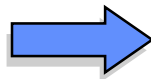


- ▲ Multiple Buyers
- ▲ Multiple Commands
- ▲ Multiple Contractors



- ▲ One Buyer
- ▲ One Command
- ▲ One Source of Supply

Process



Old

- ▲ Too Many Players
- ▲ Process Improvements not Timely
- ▲ Lack of Management Focus
- ▲ Lack of Standardization

New

- ▲ Partnership With Government and Industry
- ▲ Incorporate Best Commercial Practices
- ▲ Performance Spec
- ▲ Continuous Improvements
- ▲ Holistic Support



Abrams Re- Power (Phase II)



Market Survey
RFI



AlliedSignal Engines
GDLS
GE/AlliedSignal
Perkins
ATD
Howell Inc
MDS - PRAD
PATs Inc
Pratt Whitney
Rolls - Royce
Sensa Technologies

Implement



POM



Decision

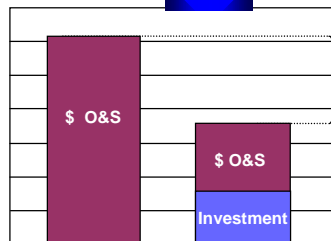
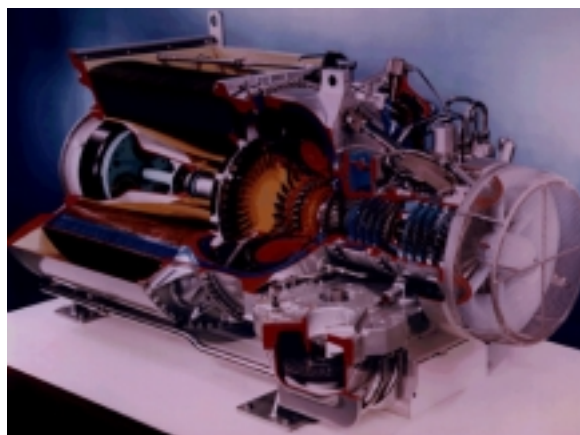


Report



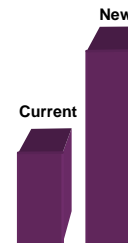
Analyze

Team: PM/AMSAA/AMC
Technical/Cost Analysis



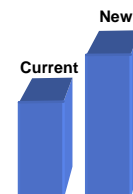
- Improve RAM
- Optimize O&S Savings
- Maintain Performance

4-5X



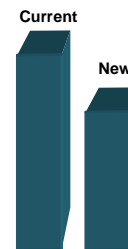
MTBR

15-20% Improvement



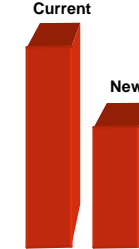
Vehicle Mobility

35% Reduction



Fuel Consumption

42% Reduction



of Parts



Focus on Four Key Initiatives



Tools

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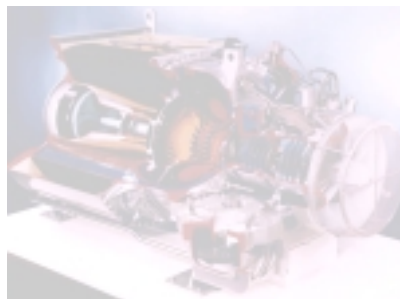
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Abrams

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(AIM)**



#3

**Technical
Support**



#4

**Performance
Based Field
Logistics Support-
M1A2 Unique**





AIM Overhaul Program - Background



- Over 4500 M1A1s Produced 1985-93; Must Sustain Aging M1A1 Fleet through 2030
- Innovative Teaming of Depot (ANAD) and Contractor (GDLS)
- Overhauls Tank to Original Factory Standards Applying all MWOs
- Proof of Principle completed 1997
- FY98 45 Tank Program Contract Award - Sep 98
- Program Resourced in Budget and POM



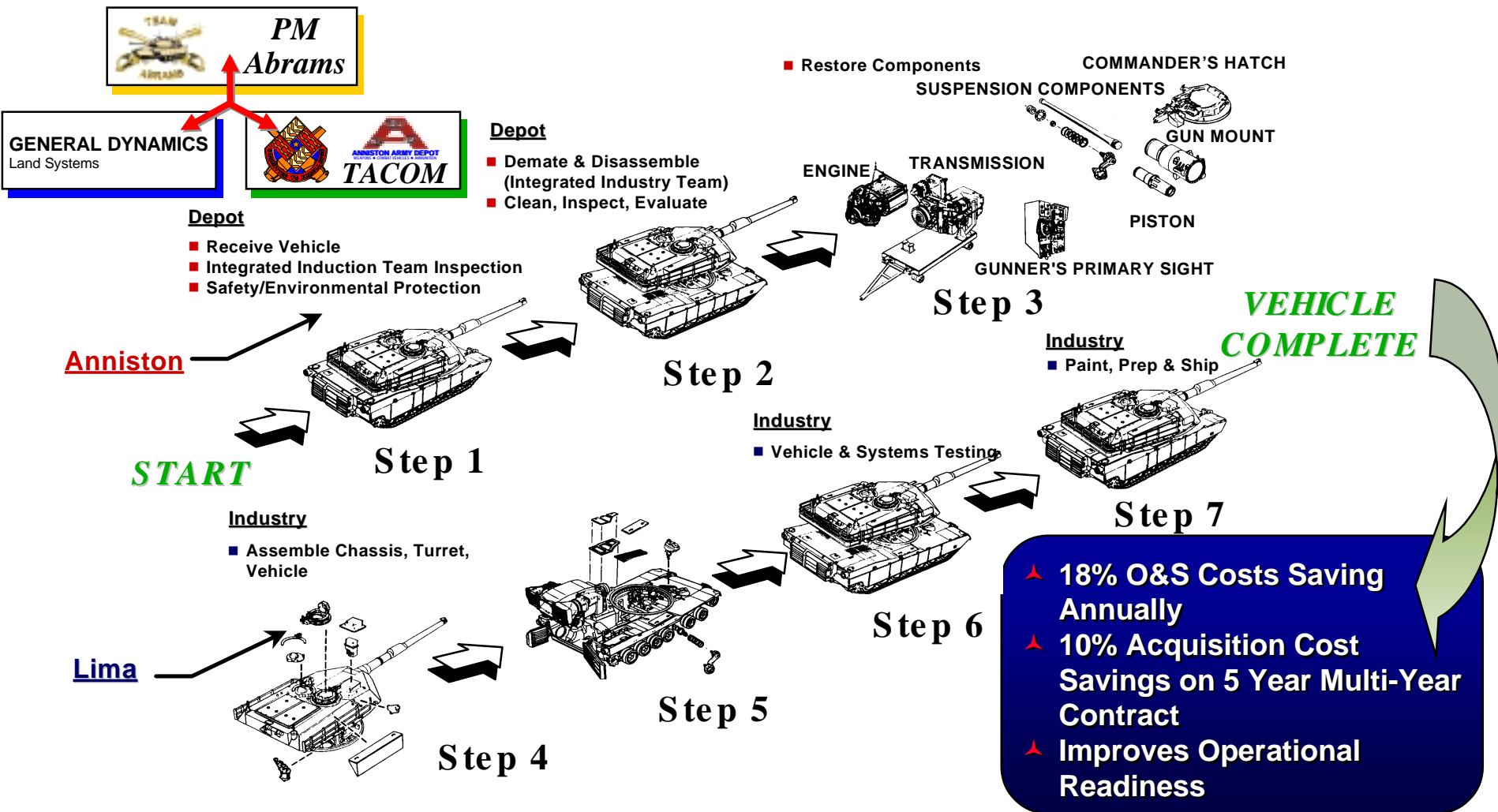
Improves Readiness Not Overmatch



AIM Overhaul Program



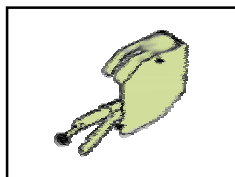
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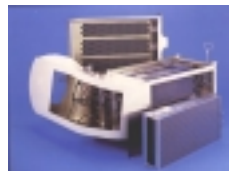


AIM Overhaul Program

Applied Improvements



**Battlefield Override
(Mechanical Fuel &
Transmission Bypass)**



**Pulse Jet Air
System (PJS)**

**External Auxiliary
Power Unit (EAPU)**



Installation Kit

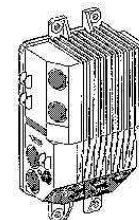
M1A1D "A" Kit



**Upgraded Tank
Commander's Panel**



**Eye Safe Laser
Rangefinder**



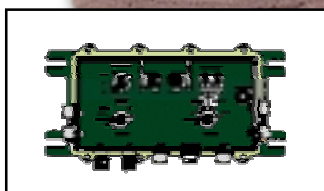
**Revised Hull
Networks Box**



**Digital Electronics
Control Unit**



**Drivers Hatch Interlock
(DHI)**



**Vehicle Intercom System
(Replace Analog System)**



**Revised Turret
Networks Box**





Focus on Four Key Initiatives



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Source
Product
Support**

**Modernization
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Spares**

**PM
Life Cycle
Responsibility
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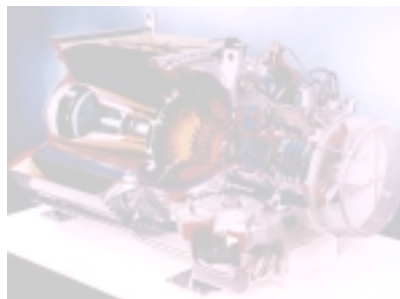
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Abrams

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**Abrams Engine
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#2

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Management Program
(AIM)**



#3

**Technical
Support**



#4

**Performance
Based Field
Logistics Support-
M1A2 Unique**



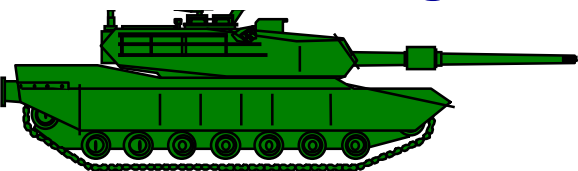


Technical Support - Background



**As Abrams Tank Moves from Production to Out of Production
Available System Technical Support (STS) Dollars Shrink**

PAA Funding



In Production STS

FY99/\$63M



OMA Funding



Out of Production STS

**FY06/~\$0M
(Basically Unfunded)**

But Significant Requirements

**Still
Exist**

**Attacking Obsolescence
Safety
O&S Cost Reductions
Field Problems
Post Deployment Software Support**

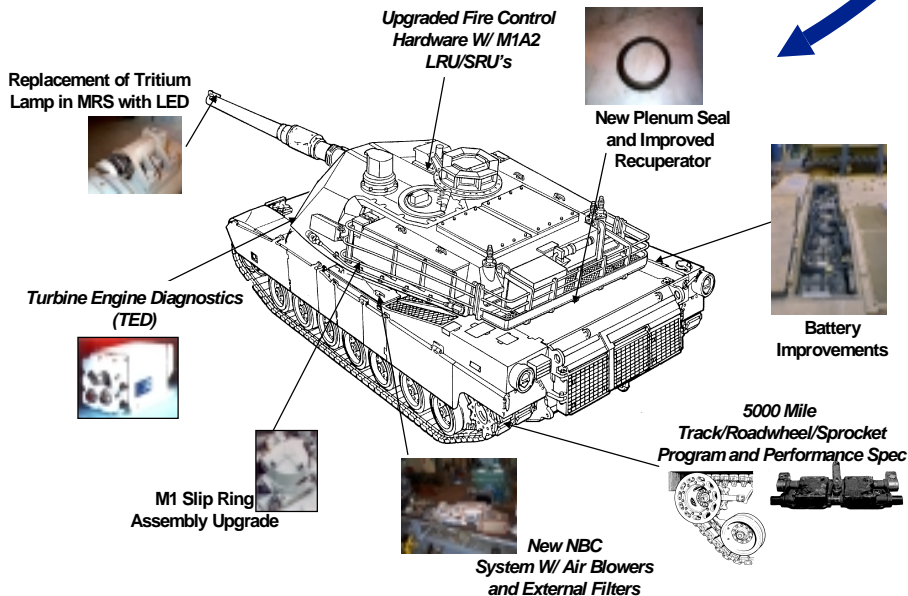


Technical Support



Examples

Sustainment



O&S



Current TNB/STE M1

- ▲ Analog
- ▲ Unreliable
- ▲ Obsolete



Digital TNB With BIT/FIT

- ▲ Digital
- ▲ Reduces Diagnostics Time
- ▲ VME Chassis
- ▲ Eliminates STE M1

Safety



DHI

- ▲ Several Soldiers Killed/Injured
- ▲ Investigate Problem
- ▲ Design Solution
- ▲ Procure and Apply Solution



Abrams Diagnostics



17% of the
Abrams Fleet



M1A2 & M1A2 SEP (Actual)

Embedded Diagnostics:

- ▲ Self Test (ST)
- ▲ Built in Test (BIT)
- ▲ Fault Isolation Test (FIT)

*TED Only to Support
FUPPs*

~~TED~~
At Downsite

~~STE-M1~~
DIGITAL
ANALOG

M1A1 (Desired)

Embedded Diagnostics in:

- ▲ New Turret Networks Box With BIT
- ▲ New Hull Networks Box With BIT

TED Only to Support FUPPs

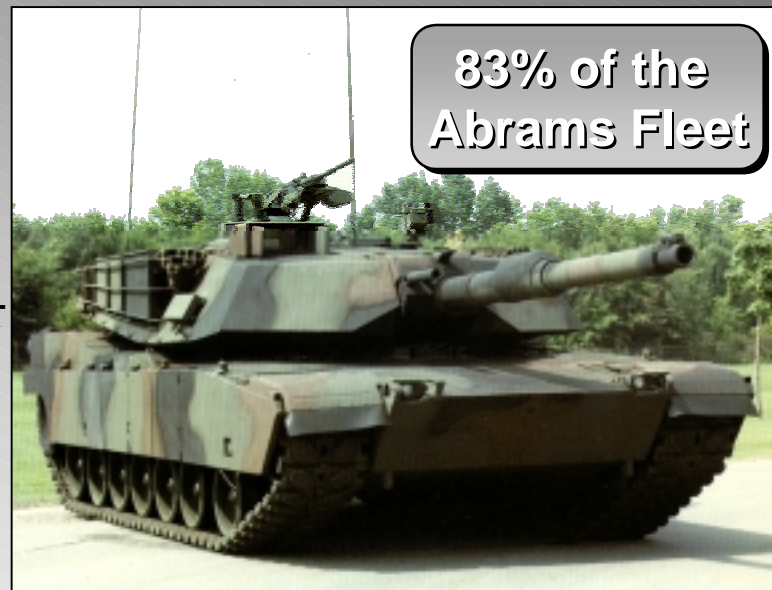
**Current Diagnostics
Virtually NO BIT/FIT**

Only 1 of 23 Electronic
LRUs has Built in Test (BIT)

~~TED~~
At Downsite

~~STE-M1~~

83% of the
Abrams Fleet





Attacking Obsolescence & BIT/FIT



Old M1A1 TNB

- ▲ Analog LRU (1980 Technology)
- ▲ Unreliable
- ▲ Obsolete Hardware
- ▲ Many Variations in the Field

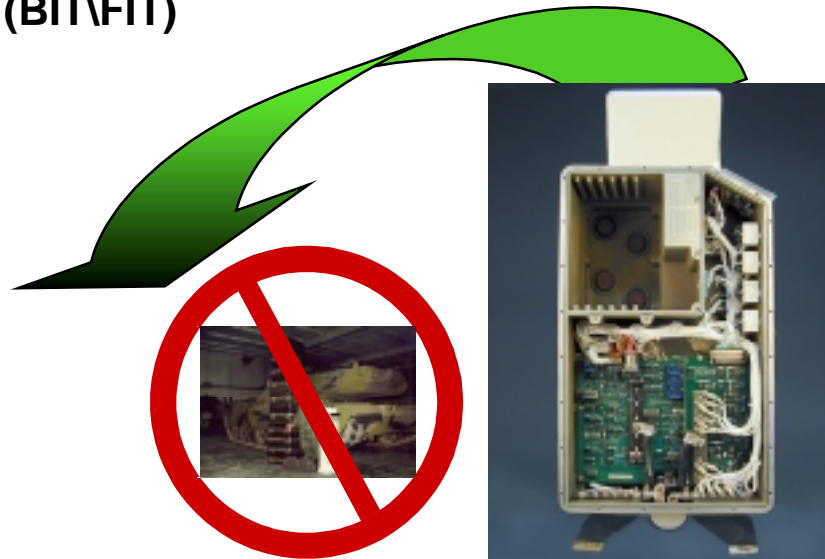


New M1A1 RTNB

- ▲ Digital LRU (1999 Technology)
- ▲ Retain Current Form/Fit/Function
- ▲ Incorporate
 - ★ Five VME Slots
 - ★ Two PCMCIA Slots
 - ★ One COTS HD
- ▲ Four Utility Jacks
- ▲ Electronic Circuit Breakers
- ▲ Allows for Incorporation of Embedded Diagnostics Functions (BIT\FIT)

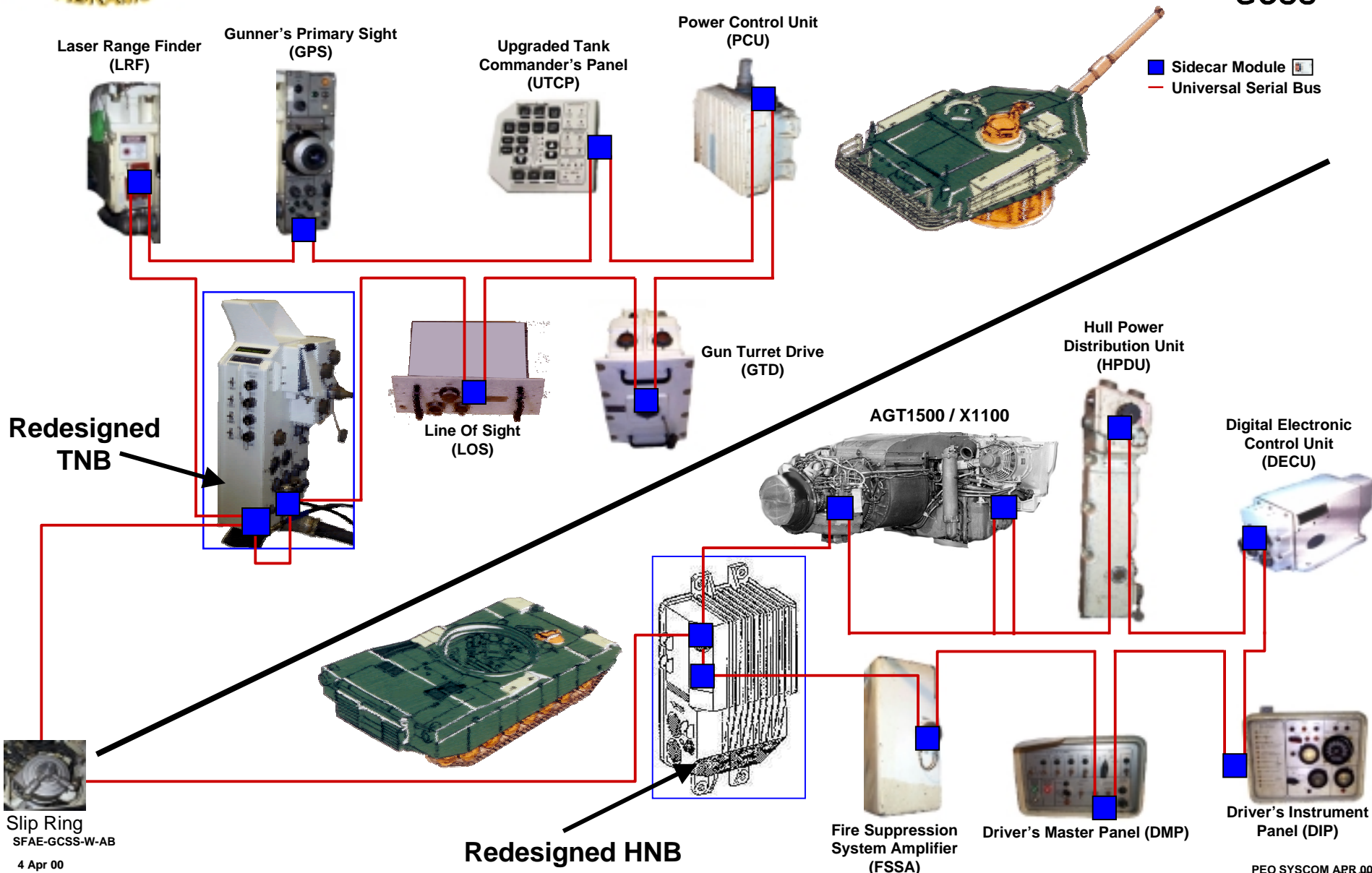


STE-M1
(10 Boxes)





Electronic Obsolescence / BIT/FIT





Focus on Four Key Initiatives



Tools

**Best
Commercial
Practices**

**Competitively
Source
Product
Support**

**Modernization
Through
Spares**

**PM
Life Cycle
Responsibility
(PMOLCS)**

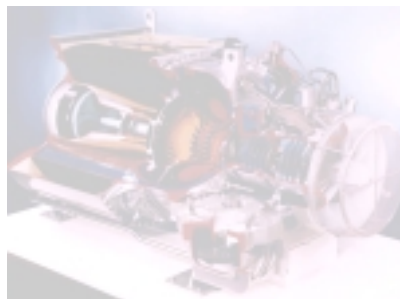
**Increase
Prime Vendor
&
Virtual
Prime Vendor**

Abrams

Pilot

#1

**Abrams Engine
System**



#2

**Abrams Integrated
Management Program
(AIM)**



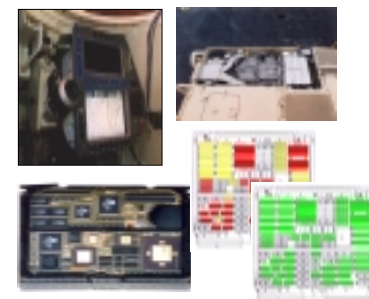
#3

**Technical
Support**



#4

**Performance
Based Field
Logistics Support-
M1A2 Unique**





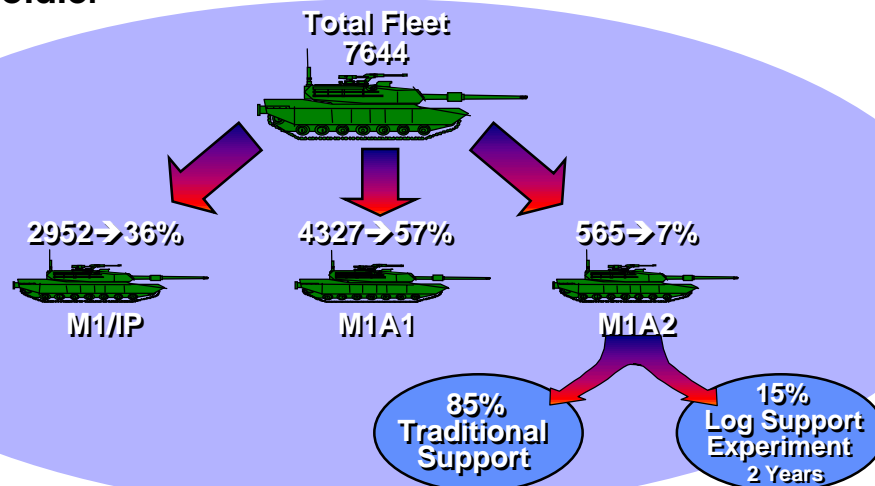
Logistics Support - Background



How Are We Different From Prime Vendor Support?

- ▲ GDLS is the Depot Level Repair Facility for M1A2 Unique Support
- ▲ Concept
 - ★ TACOM/PM Abrams/GDLS Partnership
 - ★ Provides M1A2 Unique Spares and Repairs via Direct Ship, Electronic Data Interchange (EDI) and Electronic Commerce (EC)
- ▲ Does Not “Take” the Customers Money
 - ★ Reduce Surcharge 15-20%
 - ★ Streamline Order/Delivery Process (Velocity Management)
 - ★ AWCF Funded
 - ★ Invisible to the Soldier

M1A2 Unique Components Only



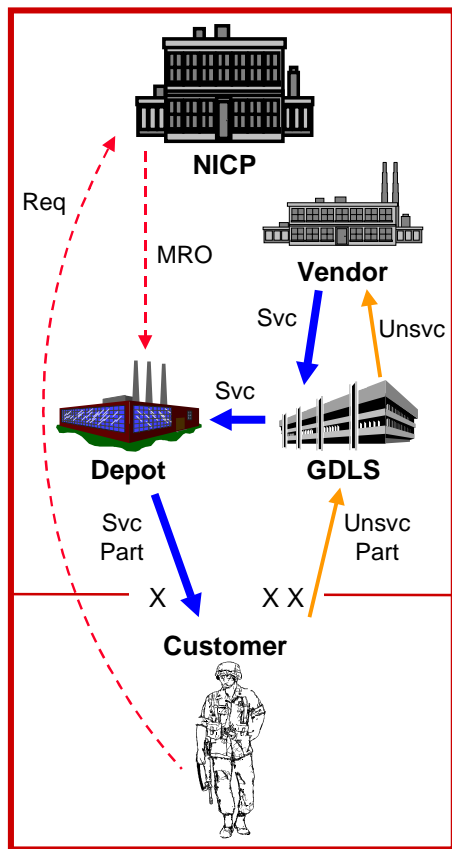


Logistics Evolution



Team Abrams Partnership (TAP) PM/AMC/OEM

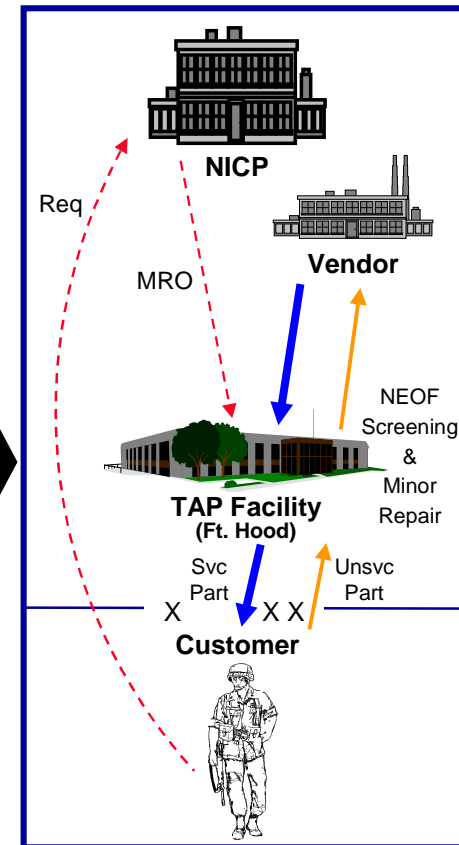
Old Process



Improvements/Benefits

- ▲ **Reduced Cycle Times**
 - ✦ Increased Readiness
 - ✦ Reduced Pipeline/Costs
- ▲ **15% Surcharge Reduction**
 - ✦ No Up-Front Customer Funding Required
- ▲ **Standard Retail Supply System**
 - ✦ Invisible to Soldier
- ▲ **Direct Vendor Delivery**





New Process





Product Support Plan Scorecard



	Best Commercial Practices	Competitive Source Product Support	Modernization Through Spares (MTS)	PM Life Cycle Responsibility (PMOLCS)	Increase Prime Vendor and Virtual Prime Vendor
 Abrams Engine System	<ul style="list-style-type: none"> • Inventory Reduction • Increase MTBR • IPT Synchronized Approach • Reduce Demand • Commonality (Wolverine) 	<ul style="list-style-type: none"> • TACOM/Industry Partnership with Anniston (PROSE) • Viable Industrial Base • Quarterly IPR with Customers & Contractors 	<ul style="list-style-type: none"> • Warranty of Spares • Contractor Incentivized to Increase Reliability 	<ul style="list-style-type: none"> • IPT Leader -- Unity of Command • Synergy with Other Tank Efforts 	<ul style="list-style-type: none"> • A/S Commercial Supply Chain Management (SCM) • One Partner Interface • Long Term Partner
 AIM Tank Program	<ul style="list-style-type: none"> • Technology Insertion • Long Term Contracting • Economy of Scale • Service Life Extension of Weapon System 		<ul style="list-style-type: none"> • Incorporation of Tank ECPs 	<ul style="list-style-type: none"> • IPT Leader -- Unity of Command • Synergy with Other Tank Efforts 	<ul style="list-style-type: none"> • Long Term Partner
 Technical Support	<ul style="list-style-type: none"> • Eliminate Obsolescence • Reduce Inventory Pipeline • Maintenance Man-hours • Reduce Incorrect Diagnosis (No Evidence of Fault[NEOF]) • Increase System Safety 		<ul style="list-style-type: none"> • Redesign High Cost Parts 	<ul style="list-style-type: none"> • IPT Leader -- Unity of Command • Synergy with Other Tank Efforts 	
 Performance Based Field Logistics Support M1A2 Unique Components	<ul style="list-style-type: none"> • Reduce Logistics Response Time • Increase Customer Satisfaction • Reduce Overhead Costs 	<ul style="list-style-type: none"> • On-site Support • Improves Training (Organic and Refresher) 	<ul style="list-style-type: none"> • Real Time Failure Feedback and Process Improvement 	<ul style="list-style-type: none"> • IPT Leader -- Unity of Command • Synergy with Other Tank Efforts 	<ul style="list-style-type: none"> • DVD • EDI/EC • Long Term Partner



Focus on O&S Cost Reduction



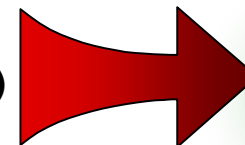
Current O&S
(4 Pilot Initiatives)
\$31.8B



**\$4B
Investment**



Projected O&S
(4 Pilot Initiatives)
\$15.3B



**\$17.0B
Savings**

(Engine IMP Program)

\$16.1



(AIM Overhaul Program)

13.2

(SSTS/Elec OBS)

1.6

(M1A2 Unique Log Supt)

.9

\$3

(Engine IMP Program)

10.6

(AIM Overhaul Program)

.9

(SSTS/Elec OBS)

.8

(M1A2 Unique Log Supt)

Current O&S

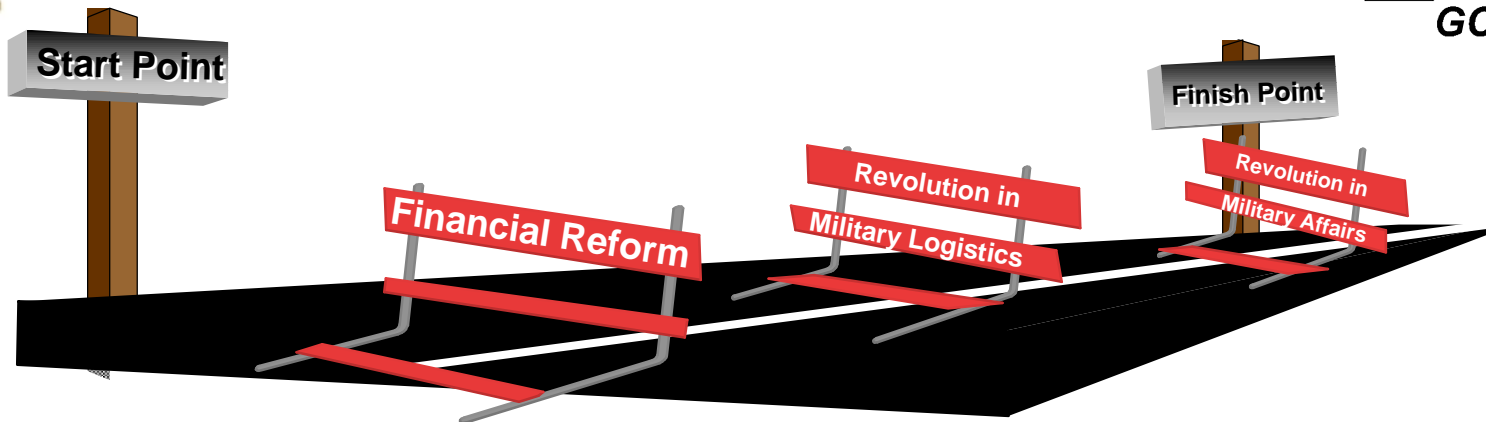
(4 Pilot Initiatives) Program

Projected O&S (30 Years)

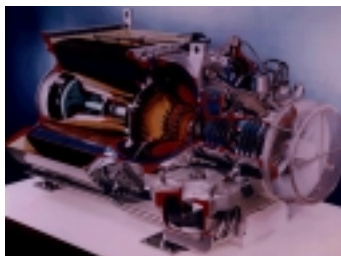
With Full Pilot Implementation



Pentagon Level Prerequisite Actions



Abrams Pilot Program



**Abrams
Engine System**



**Abrams Integrated Management
Program (AIM)**



Technical Support



**Performance
Based Field
Logistics Support-
M1A2 Unique**

▲ Program Defined ▲

- ▲ Limited Implementation -- Full Implementation Requires Help From Senior Leadership ▲
- ▲ Up-Front Investment Required to Optimize/Maximize O&S Cost Reduction ▲



Summary



- ✓ **These Leading Edge Programs Ensure the Abrams Tank will Continue to be “Best in the World”**
- ✓ **Use of Rebuild, Retrofit and Remanufacturing Programs Significantly Reduces Life Cycle Costs**
- ✓ **PM Abrams is Aggressively Seeking Avenues to Reduce Total Cost of Ownership**
- ✓ **Teaming with Industry/Depots Provides Innovative Programs to Reduce Life Cycle Costs and Improve Reliability**